HW p. 674

4)

(a) $\widehat{\text{price}} = -3.11686 + 94.4539(\text{size})$

For every 1 square foot, the price increases by $94.45

(b) IGNORE

(c) std. dev. of residuals = on average, the points are $53,790 away from the LSR line

(d) $SE_b = 2.393$

(e) IGNORE

$b \pm (t^*)(SE_b) = (94.4539) \pm (1.962)(2.393)$

$= (89.76, 99.15)$ df = 1062

We are 95% confident that for every increase of 1 square foot of the home, the price goes up between $89.76 an $99.15.

(c) $t = \frac{b}{SE_b} = \frac{0.675075}{0.0568} = 11.9$ (or 11.885)

$2 \cdot P(t > 11.9 \mid df = 160) = 8.5968 \times 10^{-24}$

- We reject Ho b/c p-value of $8.5968 \times 10^{-24} <$ alpha = 0.05.
- We have sufficient evidence that the slope of the population regression line is not equal to 0.
- Thus as verbal scores increase, math scores change.

There is evidence of an association between verbal and math scores.

6) (a)

Conditions:

1) SRS	1) stated SRS
2) Linear data	2) scatterplot is roughly linear w/ no outliers
3) Independence	3) each home can be assumed independent of the others
4) Normal residuals	4) histogram of residuals is normally shaped
5) Equal variance	5) residual plot shows no change in spread of residuals

Conditions met --> t-distribution --> Lin Reg T-interval

18) (a) Ho: $\beta_1 = 0$

Ha: $\beta_1 \neq 0$

(b) **Conditions**:

1) SRS	1) assumed representative
2) Linear data	2) scatterplot is roughly linear w/ no outliers
3) Independence	3) each student can be assumed independent of the others
4) Normal residuals	4) histogram of residuals is normally shaped
5) Equal variance	5) residual plot shows no change in spread of residuals

Conditions met --> t-distribution --> Lin Reg T-Test

35) (a) Ho: $\beta_1 = 0$

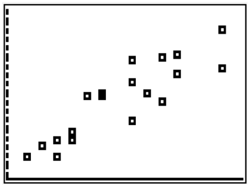
Ha: $\beta_1 \neq 0$

(b) **Conditions: (see plots on next page)**

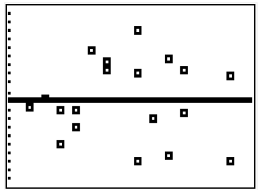
1) SRS	1) assumed representative
2) Linear data	2) scatterplot is roughly linear w/ no outliers
3) Independence	3) each person can be assumed independent of the others
4) Normal residuals	4) normal prob. plot of residuals is linear
5) Equal variance	5) residual plot shows no change in spread of residuals

Conditions met --> t-distribution --> Lin Reg T-Test

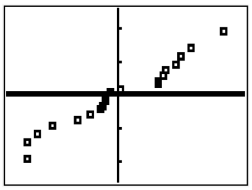
Scatterplot:



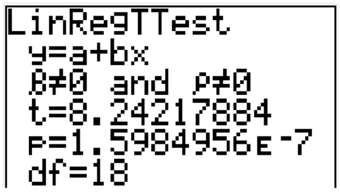
Residual plot



Normal Probability plot:



Calculator output:



$t = \dfrac{2.184}{0.265} = 8.2422$

$8.2422 = \dfrac{2.184}{SE_b}$

$2*P(t > 8.2422 \mid df = 18) = 1.6 \times 10^{-7}$

- We reject Ho b/c p-value of 1.6×10^{-7} < alpha = 0.05.
- We have sufficient evidence that the slope of the population regression line is not equal to 0.
- Thus as waist size increases, body fat % changes.

There is evidence of an association between waist size and body fat %.

(b) conditions met --> t distribution --> LinReg t-Interval

$b \pm (t^*)(SE_b) = (2.184) \pm (2.101)(0.265) = (1.627, 2.741)$

We are 95% confident that for every increase of 1 inch of waist size, the body fat % goes up btw 1.627% and 2.741%.